

REMARKS

The following remarks are provided in response to the Final Office Action ("office action") mailed February 25, 2008 in which the office action:

- rejected claims 1, 3-4, 6-12, 14-15, 17-22, 24 and 26-42 under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement.
- rejected claims 1, 3-4, 6-9, 12, 14-15, 17, 24, 26-28, 31, 33-35 and 37-42 under 35 U.S.C. §103(a) as being unpatentable over WO99/043023 – US 6,372,581 to Bensahel et al. (hereinafter Bensahel).
- rejected claims 10, 11, 29, 30 and 32 under 35 U.S.C. §103(a) as being unpatentable over Bensahel in view of US Pub. 2002/0197884 to Niimi et al. (hereinafter Niimi).
- rejected claims 18-22 and 36 under 35 U.S.C. §103(a) as being unpatentable over Bensahel in view of US Pub. 2002/0119674 to Thakur (hereinafter Thakur).

The Applicants respectfully request reconsideration of the above referenced patent application for the following reasons:

Claims 1, 3-4, 6-12, 14-15, 17-22, 24 and 26-42 rejection under 35 U.S.C. § 112

Claims 1, 3-4, 6-12, 14-15, 17-22, 24 and 26-42 are rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement.

The Applicants herein amend independent claims 1, 8, 12, 18, 24 and 38, from which claims 3-4, 6-7, 9-11, 14-15, 17, 19-22, 26-37 and 39-42 depend, and respectfully request reconsideration of claims 1, 3-4, 6-12, 14-15, 17-22, 24 and 26-42 in view of the

amendments.

Claims 1, 3-4, 6-9, 12, 14-15, 17, 24, 26-28, 31, 33-35 and 37-42 rejection under 35 U.S.C. §103(a)

Claims 1, 3-4, 6-9, 12, 14-15, 17, 24, 26-28, 31, 33-35 and 37-42 are rejected under 35 U.S.C. §103(a) as being unpatentable over Bensahel.

Independent claim 1 includes the element, “*incorporating nitrogen into a dielectric film using ammonia (NH₃) gas in a rapid thermal annealing process.*”

Independent claims 8, 12, 24 and 38 each include a similar element.

Bensahel fails to disclose “incorporating nitrogen into a dielectric film using ammonia (NH₃) gas in a rapid thermal annealing process.” In fact, Bensahel teaches away from “incorporating nitrogen into a dielectric film using ammonia (NH₃) gas in a rapid thermal annealing process,” as taught and claimed by the Applicants. Citing MPEP § 2145,

“It is improper to combine references where the references teach away from their combination. *In re Grasselli*, 713 F.2d 731, 743, 218 USPQ 769, 779 (Fed. Cir. 1983).” (Emphasis added.)

The office action combines the prior art teaching disclosed in Bensahel with an embodiment of the invention of Bensahel. Specifically, the office action alleges that ammonia may be substituted for nitric oxide in the nitric oxide thermal annealing process disclosed by Bensahel. (See office action, p. 4, third paragraph.) However, Bensahel does not describe the prior art method by which ammonia is used for nitriding. Thus, it is improper for the office action to assume that the prior art discloses using ammonia in a

rapid thermal annealing process. Furthermore, Bensahel discloses that, in the prior art, nitriding with ammonia leads to *“the incorporation of hydrogen atoms [that] results in the presence of fixed charges and an increase in the trapping of electrons”* and that the use of a nitric oxide thermal annealing process *“remedies the drawbacks of the prior art.”* (See Bensahel, col. 1, lines 23-29 and 46-47.) That is, Bensahel teaches away from the substitution of nitric oxide gas by ammonia gas in the nitric oxide thermal annealing process disclosed therein and, accordingly, teaches away from using ammonia in a rapid thermal annealing process. As such, **Bensahel both fails to disclose, and teaches away from, “incorporating nitrogen into a dielectric film using ammonia (NH₃) gas in a rapid thermal annealing process.”** as taught and claimed by the Applicants.

Additionally, with respect to claims 9, 19 and 28, Bensahel fails to disclose, and teaches away from, using “a temperature between about 900-1100°C.” Bensahel discloses annealing with nitric oxide “at a temperature **at most equal to 700°C,**” which is outside of the claimed range. (See Bensahel, col. 1, lines 61-62. Emphasis added.) Furthermore, Bensahel teaches away from using “a temperature between about 900-1100°C” because Bensahel discloses that temperatures as high as 850-900°C are undesirable. (See Bensahel, col. 1, lines 41-45.) As such, **Bensahel both fails to disclose, and teaches away from, using “a temperature between about 900-1100°C,”** as taught and claimed by the Applicants.

Claims 10, 11, 29, 30 and 32 rejection under 35 U.S.C. §103(a)

Claims 10, 11, 29, 30 and 32 are rejected under 35 U.S.C. §103(a) as being

unpatentable over Bensahel in view of Niimi. Claims 10 and 11 depend from independent claim 8. Claims 29, 30 and 32 depend from independent claim 24. The Applicants respectfully request reconsideration of claims 10, 11, 29, 30 and 32 in view of the amendments and above arguments regarding independent claims 8 and 24.

Claims 18-22 and 36 rejection under 35 U.S.C. §103(a)

Claims 18-22 and 36 are rejected under 35 U.S.C. §103(a) as being unpatentable over Bensahel in view of Thakur. Independent claim 1 has a similar element to independent claim 1, as described above. Thakur fails to cure the deficiencies of Bensahel pointed out with regard to claim 1. Accordingly, the Applicants respectfully request reconsideration of claims 18-22 and 36 in view of the amendments and above arguments.

CONCLUSION

The Applicants submit that they have overcome the office action's rejections of the claims and that they have the right to claim the invention as set forth in the listed claims. The Examiner is respectfully requested to contact the undersigned by telephone if it is believed that such contact would further the examination of the present application.

Pursuant to 37 C.F.R. 1.136(a)(3), the Applicant(s) hereby request and authorize the U.S. Patent and Trademark Office to (1) treat any concurrent or future reply that requires a petition for extension of time as incorporating a petition for extension of time for the appropriate length of time and (2) charge all required fees, including extension of time fees and fees under 37 C.F.R. 1.16 and 1.17, to Deposit Account No. 02-2666.

Respectfully submitted,

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Date

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